

What is claimed is:

1. A method for manufacturing an optical waveguide device, the method comprising:

disposing a plurality of optical waveguides on a first substrate in a matrix, each of the plurality of optical waveguides comprising a core having a selected number of branch points N for propagating light, and a cladding layer surrounding the core, wherein each length of sides of each grid in the matrix being X and Y, and a length of the core extending in the X direction being Z;

disposing a plurality of functional portions on a second substrate;

joining the first substrate and the second substrate together so that each of the plurality of optical waveguides opposes to a respective one of the functional portions;

forming a plurality of grooves at each of the branch points, the distance between the grooves being P and <sup>an</sup> ~~the~~ angle of each of the grooves being  $\theta$  ( $0^\circ < \theta < 90^\circ$ ), such that the following formulas are satisfied:

$$X = M \cdot P / \sin \theta \text{ (where M is natural number)}$$

$$Y = P / \cos \theta$$

$$Z \leq (N+1) \cdot P / \sin \theta; \text{ and}$$

dividing the joined first and second substrate to a respective optical waveguide device.

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2. A method for manufacturing an optical waveguide, the method comprising:

disposing a plurality of optical waveguides on a first substrate in a matrix, each of the plurality of optical waveguides comprising a core having a selected number of branch points N for propagating light, and a cladding layer surrounding the core,

wherein each length of sides of each grid in the matrix being X and Y, and a length of the core extending in the X direction being Z;

forming a plurality of grooves at each of the branch points, the distance between the grooves being P and <sup>an</sup> the angle of each of the grooves being  $\theta$  ( $0^\circ < \theta < 90^\circ$ ), such that the following formulas are satisfied:

$$X = N \cdot P / \sin \theta$$

$$Y = P / \cos \theta; \text{ and}$$

dividing the first substrate to a respective optical waveguide.

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2 ~~3.~~ An optical waveguide device manufactured by the method for manufacturing the optical waveguide device according to claim 1.

6 ~~4.~~ An optical waveguide manufactured by the method for manufacturing the optical waveguide according to claim ~~2.~~ <sup>5</sup>

3 ~~5.~~ An optical communication apparatus comprising:  
the optical waveguide device according to claim ~~3.~~ <sup>2</sup>, wherein the optical waveguide device having a light emitting device and a light receiving device;  
a light emitting device drive circuit for driving the light emitting device; and  
a data processing circuit for processing a signal output from the light receiving device.

4 ~~6.~~ The method according to claim 1, further comprising inserting a plurality of optical filters in the plurality of grooves respectively.

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7. The method according to claim ~~2~~, further comprising inserting a plurality of optical filters in the plurality of grooves respectively.